



Oct 8 2009  
11:23AM

# EXHIBIT 7

4/24/98

TO: Carol Fairbrother

FROM: Vic Dugan *VMD*

SUBJECT: EUSA Marketing Environmental Engineering MTBE Survey - Retail Stores

*CRAIG  
KNOELLER, 4/26/98  
AS DISCUSSED  
ABZ 5/1/98*

Carol - as requested, attached is the following information regarding the MTBE Survey conducted by EUSA Marketing Environmental Engineering:

- Attachment 1 - MTBE Survey Questions
- Attachment 2 - MTBE Survey Responses sorted by State and by Environmental Engineer
- Attachment 3 - MTBE Survey Responses sorted by Question and by Environmental Engineer and by State
- Attachment 4 - Map of MTBE Groundwater Clean-Up Regulatory Requirements
- Attachment 5 - 1997 Interagency Assessment Report of MTBE Drinking-Water Standards, Health Advisories/Guidelines, and Action Levels established or being promulgated by selected states
- Attachment 6 - 1997 Interagency Assessment Report of MTBE Groundwater Action and Clean-Up Levels established or being promulgated by selected states
- Attachment 7 - Summary of last year's (1997) EUSA Marketing Environmental Engineering MTBE Survey

We can discuss how best to summarize this year's MTBE Survey results for the upcoming Emerging Product Quality Issues meeting with Bob Rich.

VMD

c: w/o attachments  
Bill Dermott  
Tom Eizember  
Bill Flis  
Rene Gonzalez  
Craig Knoeller  
John Taunton  
Al Zustovich

02149834 001

ATTACHMENT 1

02149834 002

MTBE SURVEY 4/22/98 (LYNNE FREEZER to VMD - 4/22/98)

Question Name	Answer
Slate	
Are you required to test wells for MTBE?	
Approximately how many sites have been tested?	
What concentrations do you find? (Estimated Average mg/l or ppm)	
What concentration ranges do you find? High end (mg/l or ppm)	
Are the concentrations generally higher or lower than Benzene?	
Have you had to Remediate Sites for MTBE?	
Have you dealt with in-situ? How?	
Are you required to test system effluent for MTBE?	
Are you required to treat the effluent?	
How are you treating it ex-situ? (i.e. Air Stripper, carbon, clay polymer)	
Has any agency re-opened a case due to MTBE?	
Do you know of an area where this is certain to occur?	
Are there significant changes in state activity since last year? (Describe)	
Any comments?	

02149834 003

**ATTACHMENT 2**

02149834 004

# 1998 MTBE Survey by State and Engineer

Thursday, April 23, 1998

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State(s): **Alabama** (C&C Ans. for all FL)

Engineer: **Fred Button**

- 1 Are you required to test wells for MTBE? Yes
- 2 Approximately how many sites have been tested?
- 3 What concentrations do you find? (Estimated Average mg/l or ppm)
- 4 What concentration ranges to you find? High end (mg/l or ppm)
- 5 Are the concentrations generally higher or lower than Benzene? Lower
- 6 Have you had to Remediate Sites for MTBE? Only with BTEX
- 7 Have you dealt with in-situ? How? Yes, Model attenuation in RBCA
- 8 Are you required to test system effluent for MTBE? No GW systems running now
- 9 Are you required to treat the effluent? No GW systems running now
- 10 How are you treating it ex-situ? (i.e., Air stripper, carbon, clay polymer) No GW systems running now
- 11 Has any agency re-opened a case due to MTBE? No
- 12 Do you know of any area where this is certain to occur? No
- 13 Are there significant changes in state activity since last year? (Describe) Yes. State changed levels to match EPA Advisory for 20-200 down to 20-50 (or is it 20-40?)
- 14 Any comments? RBCA guidance just finalized. Unlikely that MTBE will impact us greatly in Alabama but RBCA modelling has not been completed yet.

02149834 005

# 1998 MTBE Survey by State and Engineer

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State(s): CA

Engineer: Maria Guansler

1 Are you required to test wells for MTBE?

Yes, all sites are required to have MTBE tested as a part of the quarterly monitoring program at each site.

2 Approximately how many sites have been tested?

~150 in northern California over the last couple of years.

3 What concentrations do you find? (Estimated Average mg/l or ppm)

ND to as high as 360,000 ppb. Not unusual to see 1000 ppb or greater. Detection limit expectation is 2 to 5 ppb.

4 What concentration ranges to you find? High end (mg/l or ppm)

75% of sites are >1000 ppb. Some have been >100ppm.

5 Are the concentrations generally higher or lower than Benzene?

There is no "general" trend. Sites which are ND for BTEX have MTBE, and sites with high BTEX have low and some high MTBE. The difference is that when high mtbe #'s first occur, BTEX does not usually increase.

6 Have you had to Remediate Sites for MTBE?

Very soon I will be targeting MTBE specifically. Currently I am remediating sites for BTEX which also have MTBE.

7 Have you dealt with in-situ? How?

Typically looking at pump and treat to target MTBE.

8 Are you required to test system effluent for MTBE?

Yes

9 Are you required to treat the effluent?

I am in the process of being required on many sites. Agencies are considering ranges from ND to 35 ppb.

10 How are you treating it ex-situ? (i.e., Air stripper, carbon, clay polymer)

Carbon primarily. On sites which I'm currently being asked to target MTBE, I will likely be using air stripping to carbon polish (carbon for both liquid & vapor polish after stripper). Also will be testing a biofilter with UC Davis.

11 Has any agency re-opened a case due to MTBE?

Yes

12 Do you know of any area where this is certain to occur?

No, but it is receiving a lot of consideration with many agencies.

13 Are there significant changes in state activity since last year? (Describe)

Closures are NOT being granted if MTBE exists on the site above 20 ppb or so. Agencies are considering action levels of 5 ppb to 20 ppb. I am having to complete very comprehensive & costly assessments at some sites specifically for MTBE. I expect this

14 Any comments?

The comprehensive site assessments and pending remediation for MTBE is occurring primarily in Santa Clara County (San Jose area). The other oversight agencies in the state are watching very closely, and are considering similar actions. Also, most water

02149834 006

# 1998 MTBE Survey by State and Engineer

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State(s): CT & RI

Engineer: Melissa Winsor

- |  |   |
|--|---|
| 1 Are you required to test wells for MTBE?                                     | Yes   |
| 2 Approximately how many sites have been tested?                               | 60 sites  |
| 3 What concentrations do you find? (Estimated Average mg/l or ppm)             | Difficult to determine an average   |
| 4 What concentration ranges to you find? High end (mg/l or ppm)                | Ranges from <2.0 ppb to 1,000,000 ppb   |
| 5 Are the concentrations generally higher or lower than Benzene?               | Higher  |
| 6 Have you had to Remediate Sites for MTBE?                                    | Yes   |
| 7 Have you dealt with in-situ? How?  | No (except for natural attenuation)   |
| 8 Are you required to test system effluent for MTBE?                           | Yes   |
| 9 Are you required to treat the effluent?                                      | Yes   |
| 10 How are you treating it ex-situ? (i.e., Air stripper, carbon, clay polymer) | Yes, via both air stripper and carbon   |
| 11 Has any agency re-opened a case due to MTBE?                                | No  |
| 12 Do you know of any area where this is certain to occur?                     | No  |
| 13 Are there significant changes in state activity since last year? (Describe) | No  |
| 14 Any comments?   | At many of my sites in both CT and RI I have encountered many unexplained and large fluctuations in MTBE. (i.e. Historically there is only trace concentrations of MTBE then there will be a detection in the tens of thousands, then it will return to its h |

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# 1998 MTBE Survey by State and Engineer

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State(s): FL

Engineer: Greg Clanton

- |  |  |
|--|--|
| 1 Are you required to test wells for MTBE?                                     | Yes  |
| 2 Approximately how many sites have been tested?                               | 200 (# includes entire state)  |
| 3 What concentrations do you find? (Estimated Average mg/l or ppm)             | 0.10 mg/l (median is <0.050 ug/l) ?  |
| 4 What concentration ranges to you find? High end (mg/l or ppm)                | 0 - 20.7 mg/l  |
| 5 Are the concentrations generally higher or lower than Benzene?               | depends on age of plume - generally B>MTBE because most plumes are old.                        |
| 6 Have you had to Remediate Sites for MTBE?                                    | Yes  |
| 7 Have you dealt with in-situ? How?  | natural attenuation (monitoring only)  |
| 8 Are you required to test system effluent for MTBE?                           | Yes  |
| 9 Are you required to treat the effluent?                                      | Yes  |
| 10 How are you treating it ex-situ? (I.e., Air stripper, carbon, clay polymer) | air stripper and or SVE  |
| 11 Has any agency re-opened a case due to MTBE?                                | no and Florida as of now does not intend to.   |
| 12 Do you know of any area where this is certain to occur?                     | No   |
| 13 Are there significant changes in state activity since last year? (Describe) | new regs (Ch. 62-770) effective 9/23/97; groundwater target is now 35 ug/l, down from 50 ug/l. |
| 14 Any comments?   | See this morning's E-mail for more state spec. information.                                    |

02149834 008

# 1998 MTBE Survey by State and Engineer

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State(s): GA

Engineer: Both Sanders

- |  |              |
|--|--------------|
| 1 Are you required to test wells for MTBE?                                     | No           |
| 2 Approximately how many sites have been tested?                               | NA           |
| 3 What concentrations do you find? (Estimated Average mg/l or ppm)             | NA           |
| 4 What concentration ranges to you find? High end (mg/l or ppm)                | NA           |
| 5 Are the concentrations generally higher or lower than Benzene?               | NA           |
| 6 Have you had to Remediate Sites for MTBE?                                    | No           |
| 7 Have you dealt with in-situ? How?  | No           |
| 8 Are you required to test system effluent for MTBE?                           | No           |
| 9 Are you required to treat the effluent?                                      | Not for MTBE |
| 10 How are you treating it ex-situ? (i.e., Air stripper, carbon, clay polymer) | NA           |
| 11 Has any agency re-opened a case due to MTBE?                                | No           |
| 12 Do you know of any area where this is certain to occur?                     | No           |
| 13 Are there significant changes in state activity since last year? (Describe) | No           |
| 14 Any comments?   | N/a          |

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# 1998 MTBE Survey by State and Engineer

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State(s): MA and NH

Engineer: Karen Daly

- |  |  |
|--|--|
| 1 Are you required to test wells for MTBE?                                     | Yes in both states   |
| 2 Approximately how many sites have been tested?                               | 90 total   |
| 3 What concentrations do you find? (Estimated Average mg/l or ppm)             | I have seen a wide range - from less than 0.1 ppm to more than 100 ppm   |
| 4 What concentration ranges to you find? High end (mg/l or ppm)                | see comment #7 - average is unknown  |
| 5 Are the concentrations generally higher or lower than Benzene?               | higher   |
| 6 Have you had to Remediate Sites for MTBE?                                    | remediation usually targets BTEX and MTBE  |
| 7 Have you dealt with In-situ? How?  | other than natural attenuation/dispersion no   |
| 8 Are you required to test system effluent for MTBE?                           | Yes in some instances depending on discharge requirement   |
| 9 Are you required to treat the effluent?                                      | Yes depending on discharge requirements (sanitary vs. storm)   |
| 10 How are you treating it ex-situ? (i.e., Air stripper, carbon, clay polymer) | air stripper and/or carbon   |
| 11 Has any agency re-opened a case due to MTBE?                                | no   |
| 12 Do you know of any area where this is certain to occur?                     | no   |
| 13 Are there significant changes in state activity since last year? (Describe) | Indication that MTBE allowable level in NH will drop from 100 to 70 or 40 ppb sometime this year   |
| 14 Any comments?   | In MA the remedial standard is either 70 ppb for sites in potential drinking water area or 50,000 ppb for all other sites. No indication of a change to the standards however a change could occur in response to EPA advisory. At some sites we continue to |

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# 1998 MTBE Survey by State and Engineer

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State(s): MD

Engineer: D.H.Wall

- |  |         |
|--|---------|
| 1 Are you required to test wells for MTBE?                                     | Yes     |
| 2 Approximately how many sites have been tested?                               |         |
| 3 What concentrations do you find? (Estimated Average mg/l or ppm)             |         |
| 4 What concentration ranges to you find? High end (mg/l or ppm)                | 2 to 80 |
| 5 Are the concentrations generally higher or lower than Benzene?               | Higher  |
| 6 Have you had to Remediate Sites for MTBE?                                    | No      |
| 7 Have you dealt with in-situ? How?  | No      |
| 8 Are you required to test system effluent for MTBE?                           | No      |
| 9 Are you required to treat the effluent?                                      | No      |
| 10 How are you treating it ex-situ? (I.e., Air stripper, carbon, clay polymer) | No      |
| 11 Has any agency re-opened a case due to MTBE?                                | No      |
| 12 Do you know of any area where this is certain to occur?                     | No      |
| 13 Are there significant changes in state activity since last year? (Describe) |         |
| 14 Any comments?   | N/a     |

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# 1998 MTBE Survey by State and Engineer

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State(s): NC

Engineer: J. P. Medlin

- |  |  |
|--|--|
| 1 Are you required to test wells for MTBE?                                     | Yes  |
| 2 Approximately how many sites have been tested?                               | 110  |
| 3 What concentrations do you find? (Estimated Average mg/l or ppm)             | 1.000 ppm                                    |
| 4 What concentration ranges to you find? High end (mg/l or ppm)                | .005 - 50 ppm                                |
| 5 Are the concentrations generally higher or lower than Benzene?               | Lower & usually by an order of magnitude     |
| 6 Have you had to Remediate Sites for MTBE?                                    | Yes  |
| 7 Have you dealt with in-situ? How?  | Yes / Natural Attenuation, Air sparging, UVB |
| 8 Are you required to test system effluent for MTBE?                           | Yes  |
| 9 Are you required to treat the effluent?                                      | Yes  |
| 10 How are you treating it ex-situ? (i.e., Air stripper, carbon, clay polymer) | Air stripper w/ carbon polish                |
| 11 Has any agency re-opened a case due to MTBE?                                | No   |
| 12 Do you know of any area where this is certain to occur?                     | No   |
| 13 Are there significant changes in state activity since last year? (Describe) | Yes, New RBCA program in place 1/2/98        |
| 14 Any comments?   | NC MTBE MCL=.200 ppm, may go to .025 ppm     |

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3. NJ

02149834 013

**ATTACHMENT 3**

02149834 014

# 1998 MTBE Survey by State and Engineer

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State(s): NJ

Engineer: Holly Saffold

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|--|---|
| 1 Are you required to test wells for MTBE?                                     | Yes   |
| 2 Approximately how many sites have been tested?                               | All or most in my territory (approximately 75)  |
| 3 What concentrations do you find? (Estimated Average mg/l or ppm)             | 1 ppm estimated average   |
| 4 What concentration ranges to you find? High end (mg/l or ppm)                | 150 ppm   |
| 5 Are the concentrations generally higher or lower than Benzene?               | higher, but is usually dependent upon age of the release  |
| 6 Have you had to Remediate Sites for MTBE?                                    | Yes   |
| 7 Have you dealt with in-situ? How?  | Dispersion  |
| 8 Are you required to test system effluent for MTBE?                           | not yet, however received correspondence 4/21/98 indicating that we must within 15 days   |
| 9 Are you required to treat the effluent?                                      | not yet, but DSW permit limitations of 70 ppb have been proposed  |
| 10 How are you treating it ex-situ? (i.e., Air stripper, carbon, clay polymer) | Air Stripper, Carbon if BTEX is ND  |
| 11 Has any agency re-opened a case due to MTBE?                                | no, but the NJDEP has the ability as the standards decreased by an order of magnitude about 1.5 years ago   |
| 12 Do you know of any area where this is certain to occur?                     | No  |
| 13 Are there significant changes in state activity since last year? (Describe) | yes -- they are looking to regulate MTBE and potentially TBA in discharges to surface water on or around November 1998. Another 'arm' of the NJDEP is looking for the RPs to evaluate MTBE and TBA in their discharges and determine if the discharge has had   |
| 14 Any comments?   | Currently, a coalition of interested parties (Exxon, Mobil, Star/Texaco, the NJ Fuel Merchants Association and the NJ Petroleum Council) has a meeting scheduled with the NJDEP for May 1, 1998 to discuss the treatability of MTBE via conventional means (air |

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# 1998 MTBE Survey by State and Engineer

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State(s): NJ

Engineer: Joanne Wallach

- |  |   |
|--|---|
| 1 Are you required to test wells for MTBE?                                     | Yes   |
| 2 Approximately how many sites have been tested?                               | all (I have 70 sites)   |
| 3 What concentrations do you find? (Estimated Average mg/l or ppm)             | 1000 ppb on average?  |
| 4 What concentration ranges to you find? High end (mg/l or ppm)                | 100 ppb to 100,000 ppb  |
| 5 Are the concentrations generally higher or lower than Benzene?               | Higher  |
| 6 Have you had to Remediate Sites for MTBE?                                    | Have to get concentrations down to standard but does not drive active remediation.  |
| 7 Have you dealt with in-situ? How?  | not really, only a high vacuum extraction one time event .  |
| 8 Are you required to test system effluent for MTBE?                           | No, but currently permits are being renewed and MTBE is to be added as an effluent parameter.   |
| 9 Are you required to treat the effluent?                                      | No, (see previous answer)   |
| 10 How are you treating it ex-situ? (i.e., Air stripper, carbon, clay polymer) | Air stripper and carbon as part of the system somewhat treat MTBE but are not really designed for MTBE. Because of permit renewal in progress (see last comment) new system designs are paying closer attention to treatment of MTBE.                         |
| 11 Has any agency re-opened a case due to MTBE?                                | No  |
| 12 Do you know of any area where this is certain to occur?                     | No  |
| 13 Are there significant changes in state activity since last year? (Describe) | Yes. The NJDEP is in the process of adding an effluent limitation for MTBE for our remediation system discharge permits because they are up for renewal this year. It is expected that they will set a limit of 70 ppb for MTBE on the system effluent. It is |
| 14 Any comments?   | N/a   |

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# 1998 MTBE Survey by State and Engineer

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State(s): NJ

Engineer: Scott Muska

- |  |                        |
|--|------------------------|
| 1 Are you required to test wells for MTBE?                                     | Yes                    |
| 2 Approximately how many sites have been tested?                               | 50                     |
| 3 What concentrations do you find? (Estimated Average mg/l or ppm)             | 5,000 ppb              |
| 4 What concentration ranges to you find? High end (mg/l or ppm)                | ND to 300 ppm          |
| 5 Are the concentrations generally higher or lower than Benzene?               | Higher                 |
| 6 Have you had to Remediate Sites for MTBE?                                    | No                     |
| 7 Have you dealt with in-situ? How?  | No                     |
| 8 Are you required to test system effluent for MTBE?                           | No                     |
| 9 Are you required to treat the effluent?                                      | No                     |
| 10 How are you treating it ex-situ? (i.e., Air stripper, carbon, clay polymer) | NA                     |
| 11 Has any agency re-opened a case due to MTBE?                                | No                     |
| 12 Do you know of any area where this is certain to occur?                     | No                     |
| 13 Are there significant changes in state activity since last year? (Describe) | Yes, gw criteria limit |
| 14 Any comments?   | N/a                    |

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# 1998 MTBE Survey by State and Engineer

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State(s): NY

Engineer: Mike Meola

- |  |  |
|--|--|
| 1 Are you required to test wells for MTBE?                                     | YES (Both potable and monitor wells)   |
| 2 Approximately how many sites have been tested?                               | 88   |
| 3 What concentrations do you find? (Estimated Average mg/l or ppm)             | 50,000-100,000 ppb   |
| 4 What concentration ranges do you find? High end (mg/l or ppm)                | Upper end of 1,000,000 ppb has been seen in monitor wells  |
| 5 Are the concentrations generally higher or lower than Benzene?               | Usually higher than BTEX concentrations  |
| 6 Have you had to Remediate Sites for MTBE?                                    | YES (Have had no sites with just MTBE, BTEX is usually present)  |
| 7 Have you dealt with In-situ? How?  | Pump & treat; air sparge (not usually efficient)   |
| 8 Are you required to test system effluent for MTBE?                           | YES  |
| 9 Are you required to treat the effluent?                                      | YES  |
| 10 How are you treating it ex-situ? (i.e., Air stripper, carbon, clay polymer) | CARBON   |
| 11 Has any agency re-opened a case due to MTBE?                                | No, treated as new release   |
| 12 Do you know of any area where this is certain to occur?                     | No   |
| 13 Are there significant changes in state activity since last year? (Describe) | No; state has been consistent on clean-up levels and approach over the last 2-3 years  |
| 14 Any comments?   | State action levels in dissolved phase has been 50 ppb, although there are a number of locations where levels are well below 50 ppb but potable have been impacted, issue is with taste and odor |

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# 1998 MTBE Survey by State and Engineer

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State(s): PA

Engineer: Lewis & Michaelis

- |  |   |
|--|---|
| 1 Are you required to test wells for MTBE?                                     | Yes, recently added   |
| 2 Approximately how many sites have been tested?                               | 200   |
| 3 What concentrations do you find? (Estimated Average mg/l or ppm)             | 100 - 2000 PPB  |
| 4 What concentration ranges to you find? High end (mg/l or ppm)                | 30,000 PPB ? 50,000 PPB   |
| 5 Are the concentrations generally higher or lower than Benzene?               | Yes, Higher   |
| 6 Have you had to Remediate Sites for MTBE?                                    | Yes and delineate the extent  |
| 7 Have you dealt with in-situ? How?  | No  |
| 8 Are you required to test system effluent for MTBE?                           | No  |
| 9 Are you required to treat the effluent?                                      | No  |
| 10 How are you treating it ex-situ? (i.e., Air stripper, carbon, clay polymer) | N/A   |
| 11 Has any agency re-opened a case due to MTBE?                                | Not Yet   |
| 12 Do you know of any area where this is certain to occur?                     | Probably PA   |
| 13 Are there significant changes in state activity since last year? (Describe) | Yes - revised regs - requires sampling for MTBE                       |
| 14 Any comments?   | The state's big push is to delineate the extent of MTBE in soil & GW. |

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# 1998 MTBE Survey by State and Engineer

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State(s): SC

Engineer: Beth Sanders

- |  |   |
|--|---|
| 1 Are you required to test wells for MTBE?                                     | Yes   |
| 2 Approximately how many sites have been tested?                               | Most of the 64 active cases   |
| 3 What concentrations do you find? (Estimated Average mg/l or ppm)             | 223 ug/l  |
| 4 What concentration ranges to you find? High end (mg/l or ppm)                | <1ug/l - 6210 ug/l  |
| 5 Are the concentrations generally higher or lower than Benzene?               | Variable  |
| 6 Have you had to Remediate Sites for MTBE?                                    | No remediation systems in South Carolina at this time- we would have to remediate MTBE to RBSLs or SSTLs (see comments) if we had an operational remediation system |
| 7 Have you dealt with in-situ? How?  | NA  |
| 8 Are you required to test system effluent for MTBE?                           | NA  |
| 9 Are you required to treat the effluent?                                      | NA  |
| 10 How are you treating it ex-situ? (i.e., Air stripper, carbon, clay polymer) | NA  |
| 11 Has any agency re-opened a case due to MTBE?                                | No  |
| 12 Do you know of any area where this is certain to occur?                     | No  |
| 13 Are there significant changes in state activity since last year? (Describe) | No  |
| 14 Any comments?   | Risk Based Screening Level (RBSL) for MTBE =40 ug/l, however, Site Specific Target Levels (SSTLs) can be calculated with groundwater modeling                       |

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# 1998 MTBE Survey by State and Engineer

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State(s): TN

Engineer: John Bradford

- |  |   |
|--|---|
| 1 Are you required to test wells for MTBE?                                     | Yes   |
| 2 Approximately how many sites have been tested?                               | N/a   |
| 3 What concentrations do you find? (Estimated Average mg/l or ppm)             | 1000 ppb  |
| 4 What concentration ranges to you find? High end (mg/l or ppm)                | 25,000 ppb  |
| 5 Are the concentrations generally higher or lower than Benzene?               | Lower   |
| 6 Have you had to Remediate Sites for MTBE?                                    | No  |
| 7 Have you dealt with In-situ? How?  | No  |
| 8 Are you required to test system effluent for MTBE?                           | No  |
| 9 Are you required to treat the effluent?                                      | No  |
| 10 How are you treating it ex-situ? (i.e., Air stripper, carbon, clay polymer) | N/a   |
| 11 Has any agency re-opened a case due to MTBE?                                | No  |
| 12 Do you know of any area where this is certain to occur?                     | N/a   |
| 13 Are there significant changes in state activity since last year? (Describe) | Requires to analyze for MTBE but there are no regulatory action levels. |
| 14 Any comments?   | N/a   |

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# 1998 MTBE Survey by State and Engineer

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State(s): VA, DC

Engineer: Melissa Otwell

- |  |   |
|--|---|
| 1 Are you required to test wells for MTBE?                                     | No  |
| 2 Approximately how many sites have been tested?                               | 10  |
| 3 What concentrations do you find? (Estimated Average mg/l or ppm)             | 10  |
| 4 What concentration ranges to you find? High end (mg/l or ppm)                | 1 to 200  |
| 5 Are the concentrations generally higher or lower than Benzene?               | Varies  |
| 6 Have you had to Remediate Sites for MTBE?                                    | No  |
| 7 Have you dealt with in-situ? How?  | No  |
| 8 Are you required to test system effluent for MTBE?                           | No  |
| 9 Are you required to treat the effluent?                                      | treatment required for BTEX, TPH  |
| 10 How are you treating it ex-situ? (I.e., Air stripper, carbon, clay polymer) | treatment required for BTEX, TPH (carbon,stripper, thermal/catalytic)<br>no   |
| 11 Has any agency re-opened a case due to MTBE?                                | No  |
| 12 Do you know of any area where this is certain to occur?                     | No  |
| 13 Are there significant changes in state activity since last year? (Describe) | No  |
| 14 Any comments?   | not required to test for MTBE. May initiate testing due to questions on RP. Have tested for MTBE on sites with vapor odors, due to indoor air quality issues. |

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# 1998 MTBE Survey by State and Engineer

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State(s): WA, OR, MT, CO

Engineer: Tom Wilson

- |  |      |
|--|------|
| 1 Are you required to test wells for MTBE?                                     | No   |
| 2 Approximately how many sites have been tested?                               | None |
| 3 What concentrations do you find? (Estimated Average mg/l or ppm)             | N/A  |
| 4 What concentration ranges to you find? High end (mg/l or ppm)                | N/A  |
| 5 Are the concentrations generally higher or lower than Benzene?               | N/A  |
| 6 Have you had to Remediate Sites for MTBE?                                    | No   |
| 7 Have you dealt with in-situ? How?  | N/A  |
| 8 Are you required to test system effluent for MTBE?                           | No   |
| 9 Are you required to treat the effluent?                                      | N/A  |
| 10 How are you treating it ex-situ? (i.e., Air stripper, carbon, clay polymer) | N/A  |
| 11 Has any agency re-opened a case due to MTBE?                                | No   |
| 12 Do you know of any area where this is certain to occur?                     | No   |
| 13 Are there significant changes in state activity since last year? (Describe) | No   |
| 14 Any comments?   | None |

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# 1998 MTBE Survey by State and Engineer

Thursday, April 23, 1998

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State(s): *WV (see MPO's comments for VA)*

Engineer: *Beth Zinkevich*

- |  |  |
|--|--|
| 1 Are you required to test wells for MTBE?                                     | YES  |
| 2 Approximately how many sites have been tested?                               | 70 in WV (50 in VA)  |
| 3 What concentrations do you find? (Estimated Average mg/l or ppm)             | 0.4 ppm  |
| 4 What concentration ranges to you find? High end (mg/l or ppm)                | 58 ppm   |
| 5 Are the concentrations generally higher or lower than Benzene?               | HIGHER   |
| 6 Have you had to Remediate Sites for MTBE?                                    | NO   |
| 7 Have you dealt with in-situ? How?  | NO   |
| 8 Are you required to test system effluent for MTBE?                           | Not required to treat effluent for MTBE (but required to treat effluent) |
| 9 Are you required to treat the effluent?                                      | Treatments include airstripper & liquid phase carbon for polishing.      |
| 10 How are you treating it ex-situ? (i.e., Air stripper, carbon, clay polymer) | NO   |
| 11 Has any agency re-opened a case due to MTBE?                                | Treatments include airstripper & liquid phase carbon for polishing.      |
| 12 Do you know of any area where this is certain to occur?                     | NO   |
| 13 Are there significant changes in state activity since last year? (Describe) | Not with respect to MTBE. WV has introduced a "Redevelopment Rule".      |
| 14 Any comments?   | Their version of RBCA, was primarily written for large industry.         |

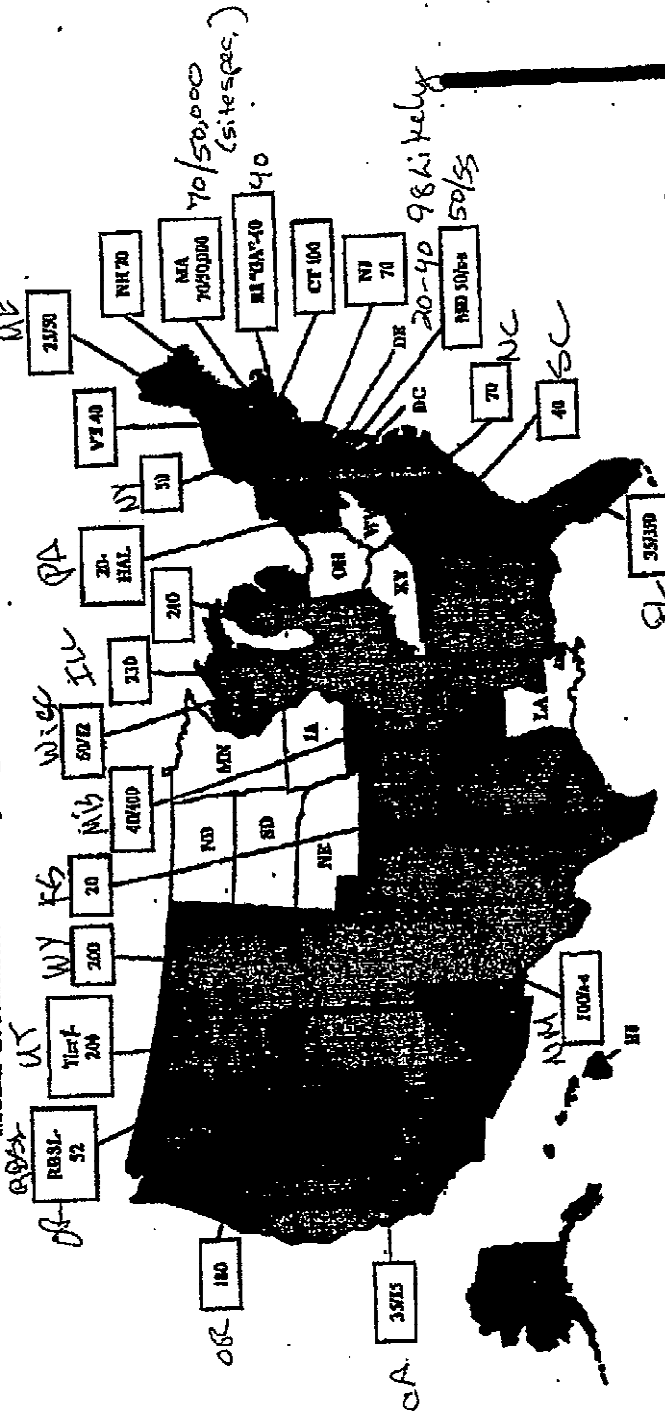
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**ATTACHMENT 4**

02149834 025

**EXXON**

MTHE Groundwater Clean-up Regulations: Current & Future



**ATTACHMENT 5**

02149834 027

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Table 2.2: Summary of MTBE drinking-water standards, health advisories/guidelines, and action levels established or being promulgated by select States.

State	Type of requirement	Regulatory level (µg/L)	Reference	Remarks
California	Interim action level	35	(1,2)	Risk assessment is currently being updated.
Connecticut	Health advisory/guideline	100	(3)	Started about 1980.
Kansas	Health advisory/guideline	100	(3)	Not specific for MTBE; applies to total VOCs.
Illinois	Health advisory/guideline	230	(4)	-
Massachusetts	Health advisory/guideline	50	(3)	-
Maine	Health advisory/guideline	50	(3)	-
New Hampshire	Health advisory/guideline	200	(3)	-
New Jersey	Health advisory/guideline Standard (proposed)	50 70	(5) (5, 6)	Standard expected to be promulgated in 1986.
New York	Standard	50	(7, 8)	Not specific for MTBE; applies to unspecified organic contaminants.
Rhode Island	Health advisory/guideline	40	(3)	-
Vermont	Standard	40	(3)	-

<sup>1</sup>State of California, Division of Drinking Water and Environmental Management memo of 31 Oct 1995.

<sup>2</sup>State of California, Pesticide and Environmental Toxicology Section, memo of 19 Feb 1991.

<sup>3</sup>Chemical Communication Subcommittee, 1990.

<sup>4</sup>Illinois Environmental Protection Agency, 1994.

<sup>5</sup>New Jersey Drinking Water Quality Institute, 1994.

<sup>6</sup>New Jersey DEP letter of July 24, 1995.

<sup>7</sup>New York DOH letter of July 6, 1995.

<sup>8</sup>New York State Department of Health, 1995.

6/97  
from John S. Zogor  
JUSGS report

ATTACHMENT 6

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Table 2.3: Summary of MTBE ground-water action and clean-up levels established or being promulgated by select States.

[MTBE, methyl tert-butyl ether,  $\mu\text{g/L}$ , micrograms per liter]

State	Regulatory level ( $\mu\text{g/L}$ )		Reference	Remarks
	Action level	Clean-up level		
Florida	--	50	Oliver, 1995	Applies to drinking sites only. Site-specific remediation standards applied to other sites.
Maine	--	50	Association for Environmental Health of Soils, 1994; Benjamin and Belluck, 1994	
Massachusetts	Not specified in regulation	~700/50,000/50,000	Oliver, 1995	a - Actual/potential drinking water supply; b - Source of vapor emissions to building; c - Everywhere.
Michigan	Same as cleanup criteria	~240/890	Oliver, 1995	d - Residential; e - Industrial/commercial.
New Mexico	100	100	Oliver, 1995; Benjamin and Belluck, 1994	--
New York	50	50	Oliver, 1995	f - Clean-up level is the action level, or when not achievable, site specific.
North Carolina	>200	>200	Association for Environmental Health of Soils, 1994; Benjamin and Belluck, 1994	--
South Carolina	Site specific	40 (Recommended)	Oliver, 1995	--
Vermont	40	Site specific	Oliver, 1995	--
Wisconsin	60	12	Oliver, 1995	--

**ATTACHMENT 7**

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**Memorandum**

To: Carol Fairbrother  
From: Martin A. Canales  
Date: 2/3/97  
RE: MTBE Survey Results

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Following are the results of the MTBE survey conducted last week. I received responses for 23 areas around the country (see attached report). As you can see, we have an abundance of data that may be very useful. Please let me know if you need further information.

*Are you required to test wells for MTBE?  
22 of 25 Engineers are required to sample wells.*

*Approximately how many sites have been tested?  
A total of approximately 1600 sites have been sampled.*

*What average concentration do you find?  
Average varied but the majority reported and average MTBE concentration in the 5-10 ppm range.*

*What are the highest concentrations you find?  
Answers varied but majority were in the 200 - 500 ppm range.*

*Are the concentrations generally higher or lower than Benzene?  
Approximately 50% split.*

*Have you had to remediate sites for MTBE?  
8 of 25 engineers have to remediate for MTBE.*

*Have you dealt with it in-situ? How?  
The majority of engineers remove the BTEX compounds via pumping, sparging, and soil vapor extraction. MTBE is removed as a result of these approaches.*

*Are you required to test system effluent for MTBE?  
Approximately 50% (12 yes, 13 no) are required to test.*

*Are you required to treat the effluent?  
10 of 25 engineers are required to treat effluent for MTBE.*

*How are you treating it ex-situ? (i.e. Air stripper, carbon, clay polymer)  
All engineers reported using air strippers and carbon. However, BTEX compounds are usually targeted for treatment.*

*Has any agency re-opened a case due to MTBE?  
None yet. But closures have been delayed or denied based on MTBE.*

*Do you of an area where this is certain to occur?  
No. Likely areas are MA, PA, CA, and TX.*

*Any Comments?  
See detail.*

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